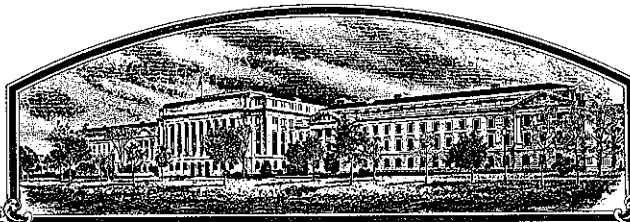


No.

9300178



# THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

*Delta and Pine Land Company*

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED DISTINCT VARIETY OF SEXUALLY REPRODUCED, OR TUBER PROPAGATED, PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF TWENTY YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE FOREGOING PURPOSES, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

SOYBEAN

'DP 3589'

*In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D.C. this thirty-first day of August in the year of our Lord one thousand nine hundred and ninety-five.*

Attest:

*RASID*  
Acting Commissioner  
Plant Variety Protection Office  
Agricultural Marketing Service

*Jan Feltman*  
Secretary of Agriculture

U.S. DEPARTMENT OF AGRICULTURE  
AGRICULTURAL MARKETING SERVICE

**APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE**  
(Instructions on reverse)

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF APPLICANT(S) (as it is to appear on the Certificate) <b>Delta and Pine Land Company</b>		2. TEMPORARY DESIGNATION OR EXPERIMENTAL NO. <b>DPX 3589</b>	3. VARIETY NAME <b>DP 3589</b>
4. ADDRESS (street and no. or R.F.D. no., city, state, and ZIP) <b>100 Main Street Scott, MS 38772</b>		5. PHONE (include area code) <b>(601) 742-3351</b>	<b>FOR OFFICIAL USE ONLY</b> PVPO NUMBER <b>9300178</b> Filing and Examination Fee: <b>\$ 2325.00</b> Date <b>March 29, 1993</b> Certificate Fee: <b>\$ 300.00</b> Date <b>July 28, 1995</b>
6. GENUS AND SPECIES NAME <b>Glycine max</b>	7. FAMILY NAME (Botanical) <b>Leguminosae</b>	9. DATE OF DETERMINATION <b>1988</b>	
8. CROP KIND NAME (Common Name) <b>Soybean</b>	10. IF THE APPLICANT NAMED IS NOT A "PERSON," GIVE FORM OF ORGANIZATION (Corporation, partnership, association, etc.) <b>Corporation</b>		
11. IF INCORPORATED, GIVE STATE OF INCORPORATION <b>Delaware</b>	12. DATE OF INCORPORATION <b>1985</b>		
13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS <b>Dr. Harry Collins P.O. Box 157 Scott, MS 38772</b>			

14. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow INSTRUCTIONS on reverse)

a. ☒ Exhibit A, Origin and Breeding History of the Variety

b. ☒ Exhibit B, Novelty Statement.

c. ☒ Exhibit C, Objective Description of Variety

d. ☒ Exhibit D, Additional Description of Variety

e. ☒ Exhibit E, Statement of the Basis of Applicant's Ownership.

f. ☒ Seed Sample (2,500 viable untreated seeds) Date Seed Sample mailed to Plant Variety Protection Office \_\_\_\_\_

g. ☒ Filing and Examination Fee (\$2,150) made payable to "Treasurer of the United States."

15. DOES THE APPLICANT(S) SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED? (See section 83(a) of the Plant Variety Protection Act)

☐ YES (If "YES," answer items 16 and 17 below) ☒ NO (If "NO," skip to item 18 below)

16. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?

☐ YES ☐ NO

17. IF "YES" TO ITEM 16, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED?

☐ FOUNDATION ☐ REGISTERED ☐ CERTIFIED

18. DID THE APPLICANT(S) PREVIOUSLY FILE FOR PROTECTION OF THE VARIETY IN THE U.S.?

☐ YES (If "YES," through ☐ Plant Variety Protection Act ☐ Patent Act Give date: \_\_\_\_\_) ☒ NO

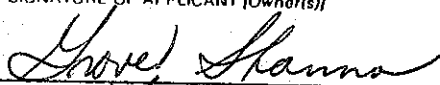
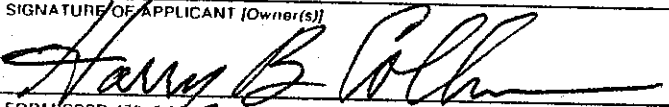
19. HAS THE VARIETY BEEN RELEASED, USED, OFFERED FOR SALE, OR MARKETED IN THE U.S. OR OTHER COUNTRIES?

☐ YES (If "YES," give names of countries and dates) ☒ NO

20. The applicant(s) declare(s) that a viable sample of basic seeds of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable.

The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in section 41, and is entitled to protection under the provisions of section 42 of the Plant Variety Protection Act.

Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

SIGNATURE OF APPLICANT [Owner(s)] 	CAPACITY OR TITLE <b>Midsouth Soybean Breeder</b>	DATE <b>3/26/93</b>
SIGNATURE OF APPLICANT [Owner(s)] 	CAPACITY OR TITLE <b>Vice President Director of Research</b>	DATE <b>3/26/93</b>

## EXHIBIT A

### DELTA AND PINE LAND COMPANY'S APPLICATION FOR DP 3589

#### ORIGIN AND BREEDING HISTORY

- 1985 - Cross number 85033 made, DP 415 X A 5980 at Scott, MS.
- 1986 - F<sub>1</sub> grown in field.
- 1987 - F<sub>2</sub> advanced to F<sub>3</sub> in winter nursery and F<sub>3</sub> plant selections pulled at Scott, MS.
- 1988 - F<sub>4</sub> plant row 88-20277 was selected, composited and determined to be stable and breeding true for important characteristics as described in exhibit C of this application. At this time no variants are known or have been observed.
- 1989 - Entered into Midsouth preliminary tests as 88-20277.
- 1990 - Tested in advanced yield tests at 10-12 locations across  
1991 the Midsouth and Southeast. Seed increase was begun in 1991 and off-type plants were removed from seed stocks.
- 1992 - Tested as DPX 3589 in state experiment tests in Midsouth and Southeast.
- 1993 - Released as DP 3589.

## EXHIBIT B

## DELTA AND PINE LAND COMPANY'S APPLICATION FOR DP 3589

## NOVELTY STATEMENT

DP 3589 most resembles P 9592, A 5980 and Terra-Vig 5555.

1. DP 3589 differs from P 9592 in that it has purple flowers and P 9592 has white flowers. Flowers of A 5980 and Terra-Vig 5555 are also purple.
2. DP 3589 differs from A 5980 in that it has resistance to stem canker and A 5980 is susceptible. DP 3589 is susceptible to race 4 soybean cyst nematode and A 5980 is moderately resistant. Also, DP 3589 has resistance to frogeye leaf spot and A 5980 is susceptible. Terra-Vig 5555 is also resistant to stem canker, race 3 and 4 cyst nematode and frogeye leaf spot.
3. DP 3589 differs from Terra-Vig 5555 in that it has resistance to race 3 and is susceptible to race 4 soybean cyst nematode whereas Terra-Vig 5555 has resistance to both race 3 and 4 of soybean cyst nematode. Soybean cyst nematode ratings for maturity group V soybeans rated in the greenhouse, Jackson, TN 1992<sup>1</sup> are below:

	Cyst Nematode Rating <sup>2</sup>		
	<u>Race 3</u>	<u>Race 4</u>	<u>Race 5</u>
DP 3589	1.0	4.6	5.0
Terra-Vig 5555	1.0	1.3	4.8

<sup>1</sup> From University of Tennessee Agricultural Experiment Station Research Report 92-15. December 1992. Page 25.

<sup>2</sup> Ratings: 1 = resistant to 5 = very susceptible

OBJECTIVE DESCRIPTION OF VARIETY  
SOYBEAN (*Glycine max* L.)

NAME OF APPLICANT(S) Delta and Pine Land Company	TEMPORARY DESIGNATION DPX 3589	VARIETY NAME DP 3589
ADDRESS (Street and No., or R.F.D. No., City, State, and Zip Code) 100 Main Street Scott, MS 38772		FOR OFFICIAL USE ONLY PVPO NUMBER 9300178

Choose the appropriate response which characterizes the variety in the features described below. When the number of significant digits in your answer is fewer than the number of boxes provided, place a zero in the first box when number is 9 or less (e.g.,  ). Starred characters ★ are considered fundamental to an adequate soybean variety description. Other characters should be described when information is available.

1. SEED SHAPE:



1 = Spherical (L/W, L/T, and T/W ratios = < 1.2)  
3 = Elongate (L/T ratio > 1.2; T/W = < 1.2)

2 = Spherical Flattened (L/W ratio > 1.2; L/T ratio = < 1.2)  
4 = Elongate Flattened (L/T ratio > 1.2; T/W > 1.2)

★ 2. SEED COAT COLOR: (Mature Seed)

1 = Yellow      2 = Green      3 = Brown      4 = Black      5 = Other (Specify) \_\_\_\_\_

3. SEED COAT LUSTER: (Mature Hand Shelled Seed)

1 = Dull ('Corsoy 79'; 'Braxton')      2 = Shiny ('Nebsoy'; 'Gasoy 17')

★ 4. SEED SIZE: (Mature Seed)

Grams per 100 seeds

★ 5. HILUM COLOR: (Mature Seed)

1 = Buff      2 = Yellow      3 = Brown      4 = Gray      5 = Imperfect Black      6 = Black      7 = Other (Specify) \_\_\_\_\_

★ 6. COTYLEDON COLOR: (Mature Seed)

1 = Yellow      2 = Green

★ 7. SEED PROTEIN PEROXIDASE ACTIVITY:

1 = Low      2 = High

★ 8. SEED PROTEIN ELECTROPHORETIC BAND:

1 = Type A (SP<sup>1a</sup>)      2 = Type B (SP<sup>1b</sup>)

★ 9. HYPOCOTYL COLOR:

1 = Green only ('Evans'; 'Davis')      2 = Green with bronze band below cotyledons ('Woodworth'; 'Tracy')  
3 = Light Purple below cotyledons ('Beeson'; 'Pickett 71')  
4 = Dark Purple extending to unifoliate leaves ('Hodgson'; 'Coker Hampton 266A')

★ 10. LEAFLET SHAPE:

1 = Lanceolate      2 = Oval      3 = Ovate      4 = Other (Specify) \_\_\_\_\_

4

## 11. LEAFLET SIZE:

☒ 21 = Small ('Amsoy 71'; 'A5312')  
3 = Large ('Crawford'; 'Tracy')

2 = Medium ('Corsoy 79'; 'Gasoy 17')

## 12. LEAF COLOR:

☒ 21 = Light Green ('Weber'; 'York')  
3 = Dark Green ('Gnome'; 'Tracy')

2 = Medium Green ('Corsoy 79'; 'Braxton')

## ★ 13. FLOWER COLOR:

☒ 2

1 = White

2 = Purple

3 = White with purple throat

## ★ 14. POD COLOR:

☒ 1

1 = Tan

2 = Brown

3 = Black

## ★ 15. PLANT PUBESCENCE COLOR:

☒ 2

1 = Gray

2 = Brown (Tawny)

## 16. PLANT TYPES:

☒ 31 = Slender ('Essex'; 'Amsoy 71')  
3 = Bushy ('Gnome'; 'Govan')

2 = Intermediate ('Amcor'; 'Braxton')

## ★ 17. PLANT HABIT:

☒ 1

1 = Determinate ('Gnome'; 'Braxton')

3 = Indeterminate ('Nebsoy'; 'Improved Pelican')

2 = Semi-Determinate ('Will')

## ★ 18. MATURITY GROUP:

☒ 0 ☒ 81 = 000  
9 = VI2 = 00  
10 = VII3 = 0  
11 = VIII4 = I  
12 = IX5 = II  
13 = X

6 = III

7 = IV

8 = V

## ★ 19. DISEASE REACTION: (Enter 0 = Not Tested; 1 = Susceptible; 2 = Resistant)

## BACTERIAL DISEASES:

★

☒ 2Bacterial Pustule (*Xanthomonas phaseoli* var. *sojensis*)

★

☐Bacterial Blight (*Pseudomonas glycinea*)

★

☐Wildfire (*Pseudomonas tabaci*)

## FUNGAL DISEASES:

★

☐Brown Spot (*Septoria glycines*)Frogeye Leaf Spot (*Cercospora sojina*)

★

☐

Race 1

☐

Race 2

☐

Race 3

☐

Race 4

☐

Race 5

☒ 2Other (Specify)  
Races Unknown☒ 0Target Spot (*Corynespora cassicola*)☒ 0Downy Mildew (*Peronospora trifoliorum* var. *manshurica*)☒ 0Powdery Mildew (*Microsphaera diffusa*)

★

☒ 0Brown Stem Rot (*Cephalosporium gregatum*)☒ 2Stem Canker (*Diaporthe phaseolorum* var. *caulivora*)

19. DISEASE REACTION: (Enter 0 = Not Tested; 1 = Susceptible; 2 = Resistant) (Continued)

9300178

FUNGAL DISEASES: (Continued)

★ ☐ 0 Pod and Stem Blight (*Diaporthe phaseolorum* var; *sojae*)

☐ 0 Purple Seed Stain (*Cercospora kikuchii*)

☐ 0 Rhizoctonia Root Rot (*Rhizoctonia solani*)

Phytophthora Rot (*Phytophthora megasperma* var. *sojae*)

★ ☐ 1 Race 1 ☐ 0 Race 2 ☐ 0 Race 3 ☐ 0 Race 4 ☐ 0 Race 5 ☐ 0 Race 6 ☐ 0 Race 7

☐ 0 Race 8 ☐ 0 Race 9 ☐ 0 Other (Specify) \_\_\_\_\_

VIRAL DISEASES:

☐ 0 Bud Blight (Tobacco Ringspot Virus)

☐ 0 Yellow Mosaic (Bean Yellow Mosaic Virus)

★ ☐ 0 Cowpea Mosaic (Cowpea Chlorotic Virus)

☐ 0 Pod Mottle (Bean Pod Mottle Virus)

★ ☐ 0 Seed Mottle (Soybean Mosaic Virus)

NEMATODE DISEASES:

Soybean Cyst Nematode (*Heterodera glycines*)

★ ☐ 1 Race 1 ☐ 1 Race 2 ☐ 2 Race 3 ☐ 1 Race 4 ☐ 1 Other (Specify) \_\_\_\_\_ Race 4 or 14

☐ 0 Lance Nematode (*Hoploaimus Colombus*)

★ ☐ 1 Southern Root Knot Nematode (*Meloidogyne incognita*)

★ ☐ 0 Northern Root Knot Nematode (*Meloidogyne Hapla*)

☐ 1 Peanut Root Knot Nematode (*Meloidogyne arenaria*)

☐ 0 Reniform Nematode (*Rotylenchulus reniformis*)

☐ OTHER DISEASE NOT ON FORM (Specify): \_\_\_\_\_

20. PHYSIOLOGICAL RESPONSES: (Enter 0 = Not Tested; 1 = Susceptible; 2 = Resistant)

★ ☐ 0 Iron Chlorosis on Calcareous Soil

☐ 1 Other (Specify) \_\_\_\_\_ Sensitive to high chloride soils

21. INSECT REACTION: (Enter 0 = Not Tested; 1 = Susceptible; 2 = Resistant)

☐ 0 Mexican Bean Beetle (*Epilachna varivestis*)

☐ 0 Potato Leaf Hopper (*Empoasca fabae*)

☐ 0 Other (Specify) \_\_\_\_\_

22. INDICATE WHICH VARIETY MOST CLOSELY RESEMBLES THAT SUBMITTED.

CHARACTER	NAME OF VARIETY	CHARACTER	NAME OF VARIETY
Plant Shape	A 5980	Seed Coat Luster	A 5980
Leaf Shape	A 5980	Seed Size	P 9592
Leaf Color	A 5980	Seed Shape	A 5980
Leaf Size	A 5980	Seedling Pigmentation	DP 415

## 23. GIVE DATA FOR SUBMITTED AND SIMILAR STANDARD VARIETY: Paired Comparison Data

9300178

VARIETY	NO. OF DAYS MATURITY	PLANT LODGING SCORE	CM PLANT HEIGHT	LEAFLET SIZE		SEED CONTENT		SEED SIZE G/100 SEEDS	NO. SEEDS/ POD
				CM Width	CM Length	% Protein	% Oil		
DP 3589 Submitted	137	2.2	91	-	-	35.7	18.2	16	-
P 9592 Name of Similar Variety	136	2.0	81	-	-	35.2	18.6	17	

## PUBLICATIONS USEFUL AS REFERENCE AIDS FOR COMPLETING THIS FORM:

1. Caldwell, B.E., ed. 1973. Soybeans: Improvement, Production, and Uses. Amer. Soc. Agron. Monograph No. 16.
2. Buttery, B.R. and R.I. Buzzell. 1968. Peroxidase activity in seeds of soybean varieties. Crop Sci., 8: 722-725.
3. Hymowitz, T. 1973. Electrophoretic analysis of SBTi-A<sub>2</sub> in the USDA soybean germplasm collection. Crop Sci., 13: 420-421.
4. Payne, R.C. and L.F. Morris. 1976. Differentiation of soybean cultivars by seedling pigmentation patterns. J. Seed Technol. 1: 1-19.

## EXHIBIT D

## DELTA AND PINE LAND COMPANY'S APPLICATION FOR DP 3589

## ADDITION DESCRIPTION OF VARIETY

DP 3589 is an F<sub>3</sub> selection composited in the F<sub>4</sub> generation from the cross DP 415 X A 5980 made at Scott, MS. It is a compliment for DP 105 with greater yield potential, taller growth, and superior stem canker, frogeye and cyst resistance.

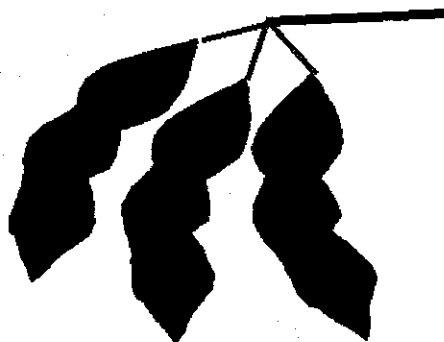
DP 3589 is a late group V maturity averaging 3% greater yield and 6 inches taller with similar lodging resistance as compared to DP 105 over 38 D&PL tests. It has purple flowers, tawny pubescence and tan pods at maturity. Seeds are shiny yellow with black hila averaging 2900 seeds per pound.

DP 3589 has stem canker and frogeye resistance and is resistant to Race 3 soybean cyst nematode. It has performed well in both the midsouth and the southeast in D&PL tests, but more consistently on clay soils of the Delta. Because of its taller height and excellent performance on tough soils, it will be a good variety to market for the Delta clays or where a taller plant is desired for early planting. DP 3589 will compete very well with P 9592, a leading group V competitor for heavy land in the midsouth, especially south of I-40.

2

**SOYBEAN PRODUCT NOMINATION FORM**

Suggested Nominee Number: DP 3589  
Experimental Designations: DPX 3589, DPX 2389, 88-20277  
Submitted by: Grover Shannon and Harry Collins (Project Leaders)  
Date Submitted: January 1, 1993  
Parentage: DP 415 X A 5980



Data Collected from 38 Replicated Yield Tests.

**I. Plant & Seed Characteristics:**

Flower Color:	Purple
Pubescence Color:	Tawny
Hilum Color:	Black
Pod Wall Color:	Tan
Seed Coat Luster:	Shiny
Leaf Shape:	Ovate
Plant Type:	Determinate
Peroxidase Activity:	Positive

## II. Agronomic Characteristics:

Line	Mat.	Plant Height	Ldg.	Shat.	Seeds/ Lb.	% Pro.	% Oil
DP 3589 Nominee	0	36	2.2	Exc.	2867	35.7	18.2
DP 105 Check	0	30	2.0	Exc.	3297	35.4	18.9
P 9592 Check	-1	32	2.0	Exc.	2793	35.2	18.6

## III. Yield Data:

## 1990-92 Yield &amp; Agronomic Data Summary

Line	Yield	% Yield	Mat.	Hgt.	Ldg.
P 9592	49.1	104	0	32	2.0
DP 3589	48.8	103	0	36	2.1
DP 105	47.1	100	0	30	2.1
# Tests	38	38	19	26	17

## 1992 Yield &amp; Agronomic Data Summary - 255M, 259A, 257C

Line	Yield	% Yield	Mat.	Hgt.	Ldg.
A 5979	52.0	112	-4	28	2.0
P 9592	50.5	109	+1	35	2.0
A 5403	49.2	106	-9	28	1.4
Hutcheson	48.5	104	-3	26	1.5
DP 3589	47.6	102	+1	37	2.2
DP 415	47.5	102	-7	28	1.9
DP 105	46.5	100	0	31	2.2
# Tests	15	15	6	10	5

## 1991 Yield &amp; Agronomic Data Summary - 155M, 157C

Line	Yield	% Yield	Mat.	Hgt.	Ldg.
P 9592	49.0	103	-1	31	2.1
DP 3589	48.7	102	0	35	2.0
DP 105	47.6	100	0	30	2.2
A 5979	47.6	100	-3	27	1.6
A 5403	45.7	96	-7	25	1.3
Hutcheson	44.2	93	-4	28	1.4
DP 415	43.9	92	-6	24	1.7
# Tests	15	15	7	8	6

## 1990 Yield &amp; Agronomic Data Summary - 059A

Line	Yield	% Yield	Mat.	Hgt.	Ldg.
DP 3589	53.1	106	0	37	2.3
P 9592	50.7	101	-1	33	1.8
DP 105	50.3	100	0	30	1.7
# Tests	8	8	6	8	5

## Yield Summary in Bu/A

## By Region: 1990 -92

Line	Midsouth		Southeast		Overall Mean	
	Yield	% Yield	Yield	% Yield	Yield	% Yield
P 9592	50.5	105	46.1	102	49.1	104
DP 3589	50.3	105	45.7	101	48.8	103
DP 105	47.9	100	45.4	100	47.1	100
# Tests	26	26	12	12	38	38

## By States: 1990-92

Line	TN	AR	MS	LA	NC	SC	GA	MEAN
P 9592	49.8	51.4	52.6	47.4	43.0	45.9	56.5	49.1
DP 3589	45.5	50.4	53.6	48.9	44.2	45.1	57.1	48.8
DP 105	46.0	50.1	48.7	45.8	41.6	46.0	62.2	47.1
# Tests	5	7	9	5	5	5	1	36

## By Soil Type, Planting and Disease Situation: 1990-92

Line	Loam	Clay	SCN	Early Planted	Stem Canker	Root Knot	SDS	Aerial Blight
DP 3589	49.4	50.5	47.1	50.2	45.1	36.6	42.7	55.3
DP 105	48.5	47.5	47.4	41.7	30.8	44.7	33.2	52.8
P 9592	50.7	50.8	46.9	45.6	36.2	42.4	46.8	56.2
# Tests	18	9	5	2	1	1	1	1

## 1990-92 Head to Head Comparisons

DP 3589 vs	Total Comp.	Won by-Bu/A	# Wins	% Wins
DP 105	38	+1.7	25	66
P 9592	38	- 0	18	47
DP 415	30	+3.1	17	57
Hutcheson	30	+2.4	15	50
A 5979	30	-2.9	13	43
A 5403	30	+1.8	9	53

YIELD IN BU/A  
BY TESTS AND LOCATIONS

1992 - 255M, 259A, 257C

Line	M I D S O U T H										Mid-Sth Mean
	TN RP	TN UC	AR CD	AR BR	AR DM	MS SE	MS SL	MS SC	LA LP	LA MG	
A 5979	53.8	52.0	65.6	59.6	49.9	56.0	55.3	40.4	38.0	54.6	52.5
P 9592	52.9	46.8	60.7	48.8	53.6	55.1	52.2	44.3	39.0	56.2	51.0
DP 3589	51.2	42.7	52.5	48.8	49.8	55.3	54.4	42.7	41.6	55.3	49.4
Hutch.	51.6	43.6	56.5	52.8	46.0	52.2	56.6	42.5	34.9	50.5	48.7
A 5403	49.5	48.6	53.4	59.6	50.8	51.4	51.6	40.4	25.3	49.6	48.0
DP 415	49.8	50.3	48.1	49.2	43.2	48.3	52.0	41.3	31.2	55.1	47.9
DP 105	49.8	33.2	54.6	49.5	47.8	52.5	50.1	38.1	35.3	52.8	46.4
LSD .05	8.8	9.8	5.9	4.7	6.6	6.3	5.9	4.2	8.1	7.9	
C. V.	10.1	18.1	7.8	5.4	8.3	7.2	7.0	6.4	15.3	9.6	

Line	S O U T H E A S T					Sth-East Mean	Over All Mean
	VA HL	NC CL	SC HV	SC OR	GA PL		
A 5979	50.0	39.2	36.7	52.8	65.7	56.2	53.7
P 9592	48.8	41.6	34.9	42.4	56.5	44.8	48.9
Hutch.	50.0	39.2	36.7	52.8	65.7	48.9	48.8
DP 3589	45.4	32.7	35.5	36.6	57.1	41.5	46.8
A 5403	54.2	33.4	28.3	41.6	58.4	43.2	46.4
DP 415	51.2	38.8	35.8	32.0	57.7	43.1	46.3
DP 105	45.2	32.6	32.7	44.7	62.2	43.5	45.4
LSD .05	9.0	10.1	7.5	14.6	5.2		
C. V.	11.3	18.5	13.7	28.0	5.4		

1991 - 155M

Line	M I D S O U T H										LA MG
	TN RP	TN UC	AR CD	AR WH	AR DM	MS SE	MS SL	MS SC	MS SC	LA LP	
P 9592	42.7	50.4	66.1	44.6	51.3	36.2	48.5	60.7	59.2	42.3	50.3
DP 3589	40.9	42.9	64.6	46.1	46.7	45.1	51.4	54.0	61.1	42.9	52.7
A 5979	45.9	42.3	64.3	49.2	49.1	34.7	49.3	49.8	57.7	47.2	47.3
A 5403	48.9	52.0	63.3	52.2	47.9	30.2	46.2	46.2	57.3	30.8	40.3
DP 105	51.0	44.6	58.8	45.2	53.9	30.8	45.3	52.6	59.4	44.1	47.3
DP 415	41.8	33.5	61.4	45.2	39.9	29.2	48.1	46.7	56.5	43.1	42.7
Hutch.	41.8	47.8	65.7	47.0	35.9	20.8	46.0	44.0	52.2	36.0	37.5
LSD .05	8.4	12.8	5.1	4.1	8.8	6.8	4.4	6.1	6.3	11.1	8.7
C. V.	12.3	13.6	5.1	6.1	11.1	11.7	5.6	7.2	7.0	16.7	11.7

Line	Mid- Sth Mean	S O U T H E A S T			Sth- East Mean	Over All Mean
		NC CL	NC KN	SC HV		
DP 3589	49.9	42.7	48.6	48.0	45.5	48.7
P 9592	50.2	48.7	36.5	44.5	43.7	48.5
A 5979	48.8	40.1	44.1	51.5	45.2	47.8
DP 105	47.2	43.2	38.9	44.5	43.6	47.2
A 5403	46.8	50.2	34.7	35.4	42.0	45.5
DP 415	44.3	46.7	40.0	50.1	45.0	44.5
Hutch.	43.2	53.0	45.9	47.7	45.7	43.8
LSD .05		8.0	7.7	5.4		
C. V.		10.5	11.2	7.5		

1990 - 059A

Line	M I D S O U T H					Mid-Sth Mean	S O U T H E A S T			Sth-East Mean	Over All Mean
	TN RP	AR DM	MS SL	MS SC	LA LP		NC CL	NC KN	SC OS		
DP 3589	50.1	44.2	65.5	52.9	51.5	52.8	58.1	38.8	62.4	53.1	53.1
P 9592	50.2	36.0	61.1	56.0	49.8	50.5	52.9	39.2	62.8	51.6	50.7
DP 105	51.5	40.5	48.5	49.0	49.7	50.7	42.6	60.4	51.2	50.3	50.7
LSD .05	5.9	15.0	8.0	11.8	6.0		8.1	10.0	9.2		
C. V.	14.4	21.7	8.5	15.3	8.2		9.0	15.1	10.0		

## IV. DISEASE REACTION AND OTHER INFORMATION:

Cyst Nematode

DP 3589 is resistant to Race 3 of Cyst Nematode and susceptible to Race 14.

	Race 3					Race 3				
	1	2	3	4	5	1	2	3	4	5
DP 3589	6	2	0	0	0	7	0	0	0	0
DP 105	0	0	0	5	4	0	0	0	0	6
Forrest	9	2	0	0	0	7	0	0	0	0
Bedford	7	2	0	0	0	-	-	-	-	-

Location: Scott, Gnhse Jackson, TN  
1-7-91 2-12-91

	Race 14					Race 14				
	1	2	3	4	5	1	2	3	4	5
DP 3589	0	0	0	6	3	0	0	0	0	6
DP 105	0	0	0	7	3	-	-	-	-	-
Forrest	0	0	3	6	1	0	0	0	0	7
Bedford	0	2	4	3	0	4	2	0	0	0

Location: Scott, Gnhse Jackson, TN  
1-9-91 3-6-91

Conducted by: Grover Shannon and Grady Robinson - Scott, MS  
Dr. L. Young, USDA, Nematologist - Jackson, TN

Root Knot Nematode 1 = No galling 5 = Very severe galling  
 DP 3589 is susceptible to Root Knot Nematode.

	<u>1990<sup>1</sup></u>	<u>Common Root Knot</u> <u>M. Incognita</u>		<u>Peanut Root Knot</u> <u>M. arenaria</u>
		<u>1991<sup>2</sup></u>	<u>1992<sup>3</sup></u>	<u>1990<sub>2</sub></u>
DP 3589	4.8	2.0	2.3	5.0
DP 105	4.3	1.0	1.0	5.0
P 9592	1.5	0.0	1.7	5.0
Check	-	-	-	4.0

Location: Hattiesburg, MS <sup>1</sup> Jay, FL <sup>2</sup> Orangeburg, SC <sup>3</sup>  
 Conducted by: Grover Shannon & Grady Robinson Dr. R. Kinloch Dr. Cindy Green  
 Nematologist & Chris Daniels

Stem Canker 1 = No symptoms 5 = Very severe symptoms  
 DP 3589 is susceptible to Stem Canker.

	<u>1990<sup>1</sup></u>	<u>1991<sup>1</sup></u>	<u>1991<sup>2</sup></u>
DP 3589	1.0	1.0	1.7
DP 105	3.0	3.0	3.7
P 9592	1.5	2.0	2.3
DP 415	1.5	1.0	1.0

Location: Scott, MS Hill Plots<sup>1</sup> and Scott Loam<sup>2</sup>  
 Conducted by: Grover Shannon and Grady Robinson

Frogeye Leaf Spot 1 = None 5 = Very Severe  
 DP 3589 is resistant to Frogeye Leaf Spot

	<u>1991</u>
DP 3589	1.0
DP 105	1.3
P 9592	1.0
A 5979	2.7
Centennial	3.0

Location: Morganza, LA  
 Conducted by: Grover Shannon and Grady Robinson

Sudden Death Syndrome

1 = No Symptoms

5 = Very Severe

DP 3589 is moderately susceptible to SDS.

1992

DP 3589	1.5
DP 105	3.2
P 9592	2.0
Hutcheson	2.7
A 5979	1.0

Location: Union City, TN

Conducted by: Grover Shannon

Aerial Blight

1 = None 5 = Very Severe

SP 3589 is moderately resistant to Aerial Blight.

1992

DP 3589	2.0
DP 105	3.0
P 9592	2.0
Hutcheson	3.3
A 5979	2.3

Location: Morganza, LA

Conducted by: Grover Shannon

Herbicide Tolerance

DP 3589 is not known to be sensitive to common herbicides at recommended rates. Above normal tolerance to the herbicide metribuzin.

Chloride Tolerance

DP 3589 is segregating for tolerance. Approximately 3 sensitive to 1 tolerant. Determined by Dr. Darel Widick, Arkansas State University - 9/91.

Seed Stock

Approximately 1917 bushels of foundation seed and 5 units of breeder seed of DP 3589.



## Variety Description

### DP 3589

DP 3589 is an F<sub>4</sub> selection composited in the F<sub>5</sub> generation from the cross DP 415 X A 5980 made at Scott, MS. It is a compliment for DP 105 with greater yield potential, taller growth, and superior stem canker, frogeye and cyst resistance.

DP 3589 is a late group V maturity averaging 3% greater yield and 6 inches taller with similar lodging resistance as compared to DP 105 over 38 D&PL tests. It has purple flowers, tawny pubescence and tan pods at maturity. Seeds are shiny yellow with black hila averaging 2900 seeds per pound.

DP 3589 has stem canker and frogeye resistance and is resistant to race 3 soybean cyst nematode. It has performed well in both the midsouth and southeast in D&PL tests, but more consistently on clay soils of the Delta. Because of its taller height and excellent performance on tough soils, it will be a good variety to market for the Delta clays or where a taller plant is desired for early planting. DP 3589 will compete very well with P 9592, a leading group V competitor for heavy land in the midsouth, especially south of I-40.

### KEY FEATURES

- Has been excellent on Delta clays compared to DP 105
- 6" taller than DP 105 with similar lodging resistance
- Excellent stem canker resistance
- Excellent frogeye resistance
- Resistance to Race 3 cyst nematode
- Field resistant to phytophthora root rot
- Susceptible to root knot nematode

### CHARACTERISTICS

Maturity	Late Group V
Flower Color	Purple
Pubescence Color	Tawny
Hilum Color	Black
Plant Height	Tall
Lodging Resistance	Good
Shatter Resistance	Excellent
Seed Size	Large - 2700-2900 Sd/lb
Stem Canker	Resistant
Phytophthora Root Rot	Field Tolerant
Cyst Nematode	Resistant to Race 3
Common Root Knot Nematode	Susceptible
Peanut Root Knot Nematode	Susceptible
Red Crown Rot	Unknown
Aerial Blight	Moderately Resistant
Chloride Sensitivity	Segregating 3 sensitive to 1 tolerant

## EXHIBIT E

## DELTA AND PINE LAND COMPANY'S APPLICATION FOR DP 3589

## STATEMENT OF APPLICANT'S OWNERSHIP

DP 3589 was originated and developed by Grover Shannon Ph.D. and Harry Collins, Ph.D., Delta and Pine Land Company Plant Breeders. By agreement between employees and Delta and Pine Land Company, all rights to any invention, discovery or development made by an employee are assigned to the company. No rights to such an invention are retained by the employee.